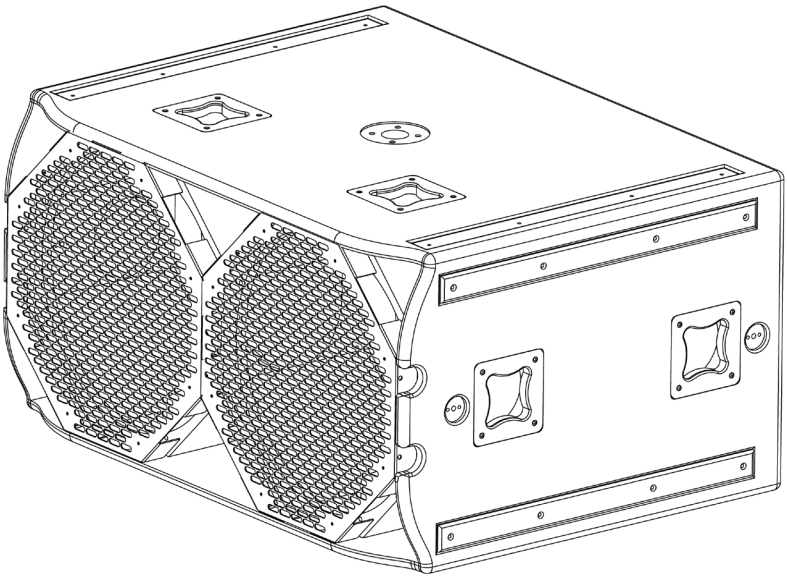
KO70

USER'S MANUAL

English



REV. B

CONTENTS

SYMBOLS

K-array declares that this device is in compliance with applicable CE standards and regulations. Before putting the device into operation, please observe the respective country-specific regulations!

WEEE

Please dispose of this product at the end of its operational lifetime by bringing it to your local collection point or recycling center for such equipment.

This symbol alerts the user to the presence of recommendations about the product's use and maintenance.

Warning! Dangerous voltages: RISK of electric shock.
Terminals marked with this symbol are HAZARDOUS LIVE and the external wiring connected to these terminals requires installation by an instructed person or the use of ready-made leads or cords.

This symbol alerts the user to the presence of recommendations about product's use and maintenance.

This device complies with Restriction of Hazardous Substances Directive.

1. INTRODUCTION

The K-array Ko40 and Ko70 are self-powered, Sub Bass speaker systems. They are best suited for high-power extended bass response applications in arenas, theatres, concert halls, churches, and outdoor events. The 21” speakers employ neodymium magnets and 6” voice coils driven by powerful D-class amplifiers. The large ports are designed toa be fully symmetrical to the speakers, which means the back loading on the drivers is consistent and even with no port air turbulence. The triangle port construction also provides excellent structural integrity and strength, effectively eliminating any box resonance.

2. APPLICATIONS

- Large scale events
- Touring sound reinforcement
- Stadiums, arenas, concert halls, theatres
- Installations in low-load capacity situations

3. KEY FEATURES

- Unique performance-to-size ratio
- Self powered Integrated DSP and remote control
- Variable vertical coverage
- Wide horizontal coverage
- Integrated flying and stacking hardware
- Top quality components for outstanding performance
- Ultra-fast set-up and dismantling system

4. UNPACKING

Each K-array loudspeaker is built to the highest standard and thoroughly inspected before leaving the factory. Upon arrival, carefully inspect the shipping carton, then examine and test your new loudspeaker. If you find any damage, immediately notify the shipping company. Only the consignee may institute a claim procedure regarding the system’s electronic equipment.

5. SAFETY

WARNING

Read all safety information below and operating instructions before using this device to avoid injury.

Safety and handling information

Warning. Failure to follow these safety instructions could result in fire, shock or other injury or damage to the device or other property.

It is important that loudspeaker systems are used in a safe manner.

Avoiding Hearing Damage. Professional loudspeakers are capable of producing extremely high sound levels and should be used carefully. Never stand close to loudspeakers driven at high volume. Set the volume to a safe level. You can adapt over time to a higher volume of sound that may sound normal but can be damaging to your hearing. Hearing loss get worse every time you're exposed to a sound level of 90 dB or over for an extended period of time. If you experience ringing in your ears or muffled speech, stop listening and have your hearing checked. The louder the volume, the less time is required before your hearing could be affected.

Choking Hazards. This device contains small parts, which may present a choking hazard to small children. Keep the device and its accessories away from small children.

Avoiding Water and Wet Locations. Do not install the system in wet or humid locations without using weather protection. Take care not to spill any food or liquid on the device. In case it gets wet, unplug all cables, turn off the device before cleaning, and allow it to dry thoroughly before turning it on again. Do not attempt to dry the device with an external heat source, such as a microwave oven or hair dryer. A device that has been damaged as a result of exposure to liquids could be not serviceable. If the device is exposed to rain or excess moisture, unplug the power cord immediately.

Keeping the Outside Clean. Handle the device with care to maintain its appearance. To clean it, unplug all cables and turn off it. Warning: unplugging the power cord is the only way to disconnect power completely. Then use a soft, dry or slightly damp cloth. Avoid getting moisture in openings. Don't use window cleaners, household cleaners, aerosol sprays, solvents, alcohol, ammonia, or abrasives to clean the device.

Carrying, Handling and Installing the device. The device contains sensitive components. Do not drop, disassemble, open, crush, bend, deform, puncture, shred, microwave, incinerate, paint, or insert foreign objects into it. If your device has been dropped or damaged, or if liquid has been spilled into the chassis, unplug the power cord immediately.

Do not operate speakers for an extended period of time with sound distortion. This is an indication of malfunction, which in turn can generate heat and result in a fire.

To reduce the risk of overheating the device, avoid exposing it to direct sunlight and take care to do not install it near heat emitting appliances, such as a room heater or stove.

No naked flame sources such as lighted candles should be placed near the device.

Operate the device in a place where the temperature is between -20°C and 50°C (-4°F to 122° F). Avoid dramatic changes in temperature or humidity when using it, as condensation may form on or within the device.

During the use, it is normal for the device to get warm. The exterior of the device functions as a cooling surface that transfers heat from inside the unit to the cooler air outside.

The device should be placed so that its location does not interfere with its proper cooling. For example, the device shouldn't be placed on beds, carpets or similar surfaces that could create an obstacle for the ventilation openings.

To reduce the risk of electric shock, unplug the power cord before connecting audio cables.

Set up your device on a stable retaining horizontal surface. If combined or mechanically connected with other products, always verify the stability of the resulted system. Install the unit only in a location that can structurally support the weight of the unit, far away from people who can interfere with the stability of the system. In case of outdoor installation, assure that the wind does not interfere with the system's stability, taking extra securities like chains, weights, ropes or any other certified anchoring systems. Doing otherwise may result in the unit falling down, causing personal injury or property damage. The system should only be suspended by qualified personnel following safe rigging practices. Secure fixings to the building structure are vital. To clarify any doubt you may have, seek help from architects, structural engineers or other specialists.

Protect the power cord from being walked on or pinched.

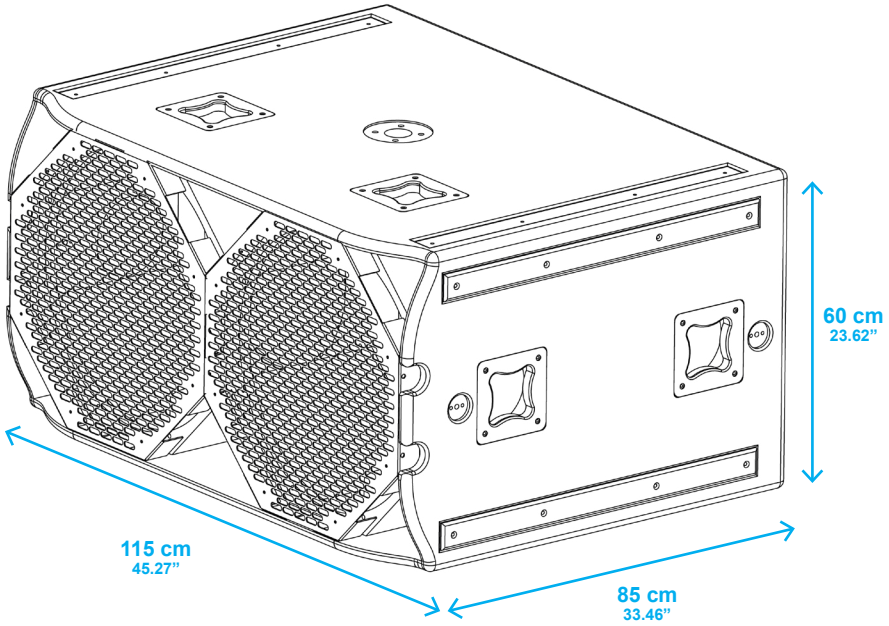
This audio system is not intended for use in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control systems,or for any other uses where the failure of the audio system could lead to death, personal injury, or sever environmental damage.

Do not make repairs yourself. Caution, risk of electric shock. Do not open the device, it contains potentially hazardous voltage. Never attempt to disassemble, repair or modify the system yourself. Disassembling the unit may cause damage that is not covered under the warranty. The device contains no user-serviceable parts. Repairs should only be performed by factory trained service personnel. Do not plug the power cord if you suspect that your device needs service or repair.

Voltage requirement. Make sure that the supplied voltage stays within the specified range. Verify that your mains connection satisfies the power ratings of the device.

Only connect the power supply to an appropriate power outlet.

Warning: since the device is a CLASS I apparatus, it must be only connected to an AC three-wire grounding outlet. If your outlet isn't grounded, contact a licensed electrician to replace it with a property grounded outlet.



weight: 78 kg (171,96 lbs)

7. AMPLIFIER

7.1 AC POWER CONNECTOR

The amplifier module and any audio equipment connected to it (mixing consoles, processors, etc.) must be properly connected to the AC power distribution, preserving AC line polarity. All grounding points should be connected to a single node or common point, using the same cable gauge as the neutral and line cables. Bad grounding connections within an audio system can produce noise, hum and/or serious damage to the input/output stages in the system's electronic equipment.

Before applying AC to any K-array self-powered speaker, be sure that the voltage potential difference between neutral and earth ground is less than 5 VAC.

7.2 VOLTAGE REQUIREMENT

The KO70's switching power supply accommodates AC mains operating at either 115V or 230V. The amplifier will continue to operate safely, without interruption, provided the AC voltage remains within 85 - 270V, at 50 or 60 Hz. Please verify that your AC mains connection is capable of satisfying the power ratings for the device.

CAUTION

Do not connect the system to AC power mains exceeding 270V. Doing so will cause significant damage to the device and create serious risk for users!

7.3 CURRENT REQUIREMENT

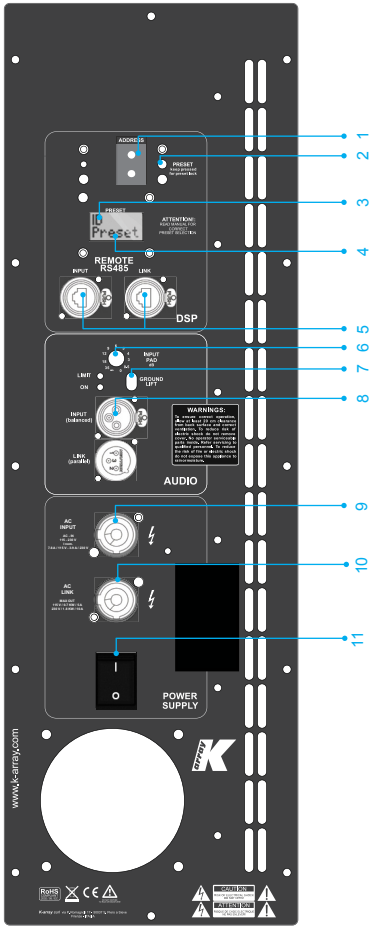
The KO70 present a dynamic load to the AC mains, drawing additional current as operating levels increase. Different cables and circuit breakers heat up at varying rates, so it is essential to understand current ratings and how they correspond to circuit breaker and cable specifications. Maximum continuous RMS current - measured over a period of at least ten seconds - is used to calculate the temperature increase in cables, which drives the proper size and gauge cable and rating for slow-reacting thermal breakers. Maximum burst RMS current - measured over a period of approximately one second - is used to select the rating for fast reacting magnetic breakers.

For best performance, voltage drops should not exceed 10% at 115V or 5% at 230V. The minimum electrical service amperage required by a K-array loudspeakers system is the sum of their maximum continuous RMS current. We recommend allowing an additional 30% above the minimum amperage to prevent peak voltage drops at the service entry.

KO40 max continuous apparent power (VA)

900VA(>10 sec) - 3500VA (<1 sec)

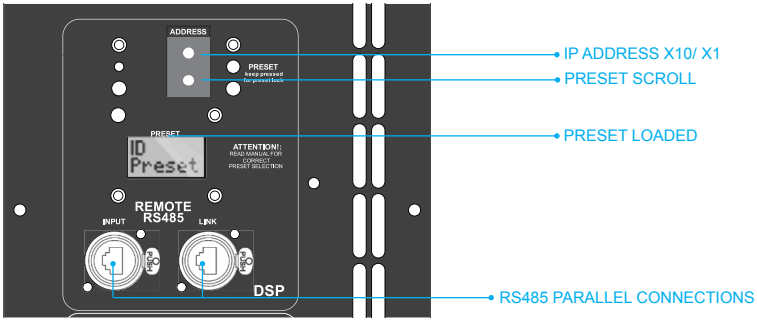
7.4 REAR PANEL



1) Address selector, (rotary x10 - x1)
2) Preset selector (Press one to change, keep 10 sec. to store)
3) ID number for remote control
4) Preset in use
5) RS485 connections for remote control (don-t connect to LAN port)
6) Input PAD level
7) Ground lift switch
8) Balanced XLR IN/OUT parallel
9) PowerCon Input
10) PowerCon parallel Output (max 5A @110V)
11) Power switch

7.5 DSP CONTROL & REMOTE CONTROL

The KO70 have a powerful DSP that manages all the functions of the speakers. Each system can store on board16 preset that can be recalled pushing the PRESET button. Once the preset will appear on the lower line of the display it will become automatically available after few seconds. If you desire to set a preset as “default” you just need, once selected it, to keep pressed for five seconds the PRESET button. After that, this preset will automatically be recall each time you will switch on your module. It is also possible to remote each module by an RS485 serial port. In order to remote your system, you need to set each module on a different address, so that, in your chain, no one module will have the same address. Two rotary encoder allow you to set the desired address number that will appear on the top line of the display. Using the remote control software it is possible to mute each system, select a desired preset loaded on-board or download a new preset pack.

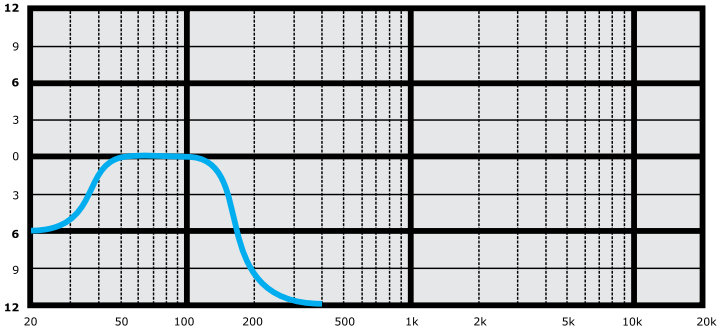


7.6 CLONER FUNCTION

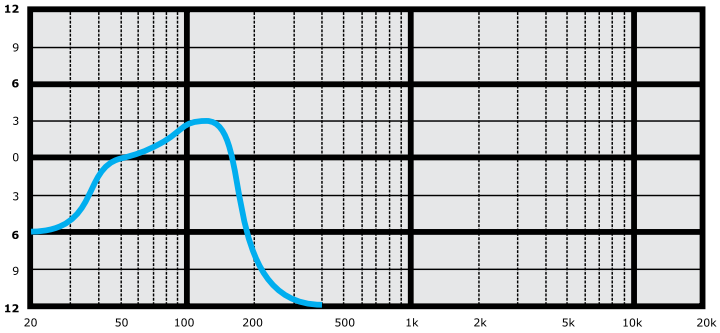
It is possible to clone the entire presets bank from Speaker to Speaker without any PC connected. We will call SpeakerA the one with the presets bank that you want clone, and SpeakerB the one that will be upgraded.
Set the SpeakerA on ID 99, will appear CLONER on the display
Keep SpeakerB on any ID number between 10 and 90.
Turn off both the speakers and connect by a RJ45 8 poles cable
Turn on the SpeakerB and after the SpeakerA
SpeakerA will start to clone, on the display will appear a cont down (00/15, 01/15, etc)
Wait till 20 seconds after 15/15
Change the ID of the SpeakerA to any other ID and turn off both Speakers
Turning on the SpeakerA check that it is on mode 16x16 and NOT 4x4.
If SpeakerA is in mode 4x4, just turn off the speaker and keep press the Preset button during the turning on
The preset are cloned to the SpeakerB

7.7 KO70 PRESETS

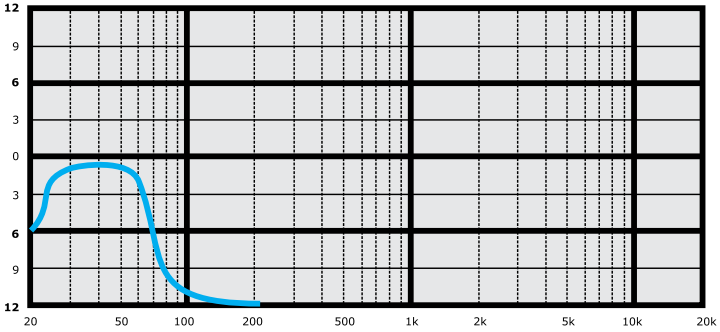
Ko70F - Flat preset



Ko70D - 120 Hz enhancement



Ko70I - Infra sub

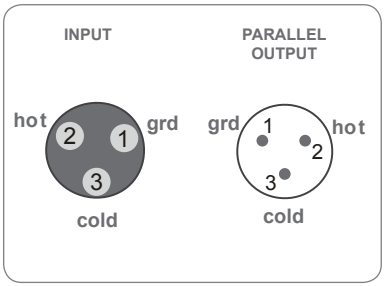


7.8 AUDIO INPUT CONNECTOR WIRING

The Audio section includes parallel LINK, which allows users to distribute an audio signal to multiple units. Up to 30 different modules can be connected in parallel on the same balanced line (with a source output impedance of 600 ohm).

CH 1 Line Input (female, balanced XLR) is wired in parallel to CH1 Line Parallel Out (male, balanced XLR). To create your own audio cables, please use the following wiring diagrams:

XLR connector



7.9 AMPLIFICATION AND PROTECTION CIRCUITRY

The KO40 is powered by the K-array digital power amplifier with a total power of 3000 watts.

All the specific functions for the KO40 such as crossovers, frequency, phase response, and loudspeakers protection are determined by a DSP processor installed inside the amplifier.

All K-array speakers are shipped with the cone drivers in correct alignment. However, if a loudspeaker needs to be replaced, make sure the replacement is reinstalled with the correct polarity. Incorrect cone driver polarity impairs the system performance and may damage the component.

8. CONFIGURATIONS

If the device is not used as a stand-alone, K-array suggests some typical configurations which can be found in the Redline System Matrix manual. The manual packs of the portable Redline systems are included and available to download on the document download page on the official K-array website. Redline systems insure a correct setup, and tested stability.

9. SERVICE

To obtain service:
1) Contact the official K-array distributor in your country. Your local distributor will direct you to the appropriate service center.
2) If you are calling for service, please have the serial number(s) of the unit(s) available for reference. Ask for Customer Service, and be prepared to describe the problem clearly and completely.
3) If the problem cannot be resolved over the phone, you may be required to send the unit in for service. In this instance, you will be provided with an RA (Return Authorization) number which should be included on all shipping documents and correspondence regarding the repair. Shipping charges are the responsibility of the purchaser.

Any attempt to modify or replace components of the device will invalidate your warranty. Service must be performed by an authorized K-array service center.

Cleaning:
Use only a soft, dry cloth to clean the housing. Do not use any solvents, chemicals, or cleaning solutions containing alcohol, ammonia, or abrasives. Do not use any sprays near the product or allow liquids to spill into any openings.

10. SPECIFICATIONS

KO70

	Acoustics
Speakers power handling	3000 w(EAS)
Maximum power	8000 w [1]
Impedance	2 X 8Ω
Frequency range	20 Hz - 150 Hz +/- 3dB (preset dependent)
SPL 1W/1mt	99.5 dB [2]
Maximum SPL	136 dB continuos - 140 dB peak
	Coverage
	Omni
	Crossover
Type	DSP controlled
Frequency	150 Hz maximum (preset dependent)
	Transducers
	2 x 21" Neodymium speakers with 6" voice coil
	Audio Input
Analog Connectors	2 male + 2 female 3-pin balanced XLR
	Remote control Input
Connectors	2 x female 8 poles RJ45
	Power Input
Connectors	2 x PowerCon IN/OUT

	Amplifiers
Type	2 modules class D - DSP controlled
Power	3500 watts x 2 channels on 8 ohm (7000 watt total [3] @8Ω
Protection	Dynamic limiter, over current, over temp, short circuits
	AC power
Operating range	115 V - 230 V, 50/60 Hz (85V – 270 V) (Auto Switch)
Max continuos and burst current	Standard 16A(>10 sec) - 32A (<1 sec)
	Physical
Dimensions	115.0 x 60.0 x 85.0 cm (45.27" x 23.62" x 33.46")
Weight	78.0 kg (171.96 lbs)

Notes for data
1. Maximum RMS applicable power for a musical signal, the reference signal is the one proposed by EIAJ standard.
2. Measured @4 mt then scaled @1 mt
3. Amplifier wattage rating is based on the maximum unclipped burst sine wave RMS voltage that the amplifier will produce into the nominal load impedance.

New materials and design are introduced into existing products without previous notice. Present systems may differ in some respects from those presented in this brochure.

11. DECLARATION OF CONFORMITY

Manufacturer/Importer: **K-array** s.u.r.l.

Brand: **K-ARRAY**
Address: via Paolina Romagnoli 17 50037 S. Piero a Sieve Firenze ITALY

Date of Issue: 14 / 03 / 12

Model Code: **KO40 - KO70**
Declaration: Complies with safety essential requirements of Council Directive

2004/108/EC on the approximation of the Laws of the Member States relating to electromagnetic compatibility.
2006/95/EC on the harmonisation of the laws of member state relating equipment designed for the use within certain voltage limits
This declaration applies to all specimens manufactured in accordance with the attached manufacturing drawings which form part of this declaration. Assessment of compliance of the product with the requirements relating to electromagnetic compatibility and low voltage directive was based on the following standards:

EMC:
EN 55103-1:2009
EN 55103-2:2009
EN 61000-3-2:2006+A1+A2
EN 61000-3-3:2008

Safety:
EN 60065:2002+A1+A11+A2+A12

Marking: CE

Applying Year: **2012**

Applied by: **K-array** s.u.r.l.
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Signed by: **Franco Spataro**
Technical Manager

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